

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Juergen BREITENBACHER et al.  
 Serial No. : 10/524,599  
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 For : METHOD AND DEVICE FOR BRAKING  
 TWO WHEELS OF A VEHICLE  
 Group Art Unit : 3657  
 Examiner : Xuan Lan T. NGUYEN  
 Confirmation No. : 6564

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AMENDMENT AFTER A FINAL OFFICE ACTION

This is in response to the Final Office Action dated December 22, 2008 (the three-month response date for which is March 23, 2009 (since March 22, 2009 is a Sunday)). Please reconsider the above-identified application in view of the following:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks** begin on page 7 of this paper.

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace, without prejudice, all prior versions, and listings, of claims in the application.

**LISTING OF THE CLAIMS:**

1-13. (Canceled).

14. (Currently Amended) A method for braking two wheels of a vehicle, comprising:

linking a first value of a first brake pressure in a first wheel brake cylinder allocated to a first wheel of the two wheels with a second value of a second brake pressure in a second wheel brake cylinder allocated to a second wheel of the two wheels, wherein the linking is given on the basis of hydraulic pressure differentials dropping at respective intake valves including a first intake valve and a second intake valve;

determining a desired second pressure differential of the hydraulic pressure differentials dropping at the second intake valve from a first pressure differential of the hydraulic pressure differentials dropping at the first intake valve;

determining, from the desired second pressure differential, a coil current for generating the desired second pressure differential; and

using the determined coil current to generate the desired second pressure differential.

15. (Canceled).

16. (Previously Presented) The method as recited in Claim 14, further comprising:

determining a coil current through the first intake valve; and

from the coil current through the first intake valve, determining the first pressure differential.

17. (Previously Presented) The method as recited in Claim 16, further comprising:

determining the first pressure differential from the coil current through the first intake valve by evaluating a characteristic curve.

18. (Previously Presented) The method as recited in Claim 14, further comprising:

determining the coil current for generating the second pressure differential from a characteristic curve characterizing the second intake valve.

19. (Previously Presented) The method as recited in Claim 18, wherein the characteristic curve is a curve characterizing a correlation between the second pressure differential and the coil current for generating the second pressure differential.

20. (Previously Presented) The method as recited in Claim 14, wherein the linking indicates a maximum value for a difference between the first pressure differential and the second pressure differential.

21. (Previously Presented) The method as recited in Claim 14, wherein the linking indicates a difference between the first pressure differential and the second pressure differential.

22. (Previously Presented) The method as recited in Claim 21, wherein a difference between the first pressure differential and the second pressure differential is a function of at least one of an existing driving condition and the time.

23. (Previously Presented) The method as recited in Claim 14, wherein the two wheels belong to the same axle.

24. (Currently Amended) A device for braking two wheels of a vehicle, comprising:  
a logic arrangement for linking a first value of a first brake pressure in a first wheel brake cylinder allocated to a first wheel of the two wheels with a second value of a second brake pressure in a second wheel brake cylinder allocated to a second wheel of the two wheels, wherein the linking is given based on hydraulic pressure differentials dropping at respective intake valves including a first intake valve and a second intake valve;

a determining arrangement to determine a desired second pressure differential of the hydraulic pressure differentials dropping at the second intake valve from a first pressure differential of the hydraulic pressure differentials dropping at the first intake valve, and to determine, from the desired second pressure differential, a coil current for generating the desired second pressure differential, wherein the determined coil current is used to generate the desired second pressure differential.

25. (Previously Presented) The device as recited in Claim 24, wherein the logic arrangement is configured so that the first pressure differential and the second pressure differential are linked via a linkage of a first coil current through the first intake valve and a

second coil current through the second intake valve.

26. (Previously Presented) The device as recited in Claim 24, wherein the first intake valve and the second intake valve are differential pressure regulating valves.

27. (Previously Presented) The device as recited in Claim 24, wherein a coil current through the first intake valve is determined, and wherein the first pressure differential is determined from the coil current through the first intake valve.

28. (Previously Presented) The device as recited in Claim 16, wherein the first pressure differential is determined from the coil current through the first intake valve by evaluating a characteristic curve.

29. (Previously Presented) The device as recited in Claim 24, wherein the coil current for generating the second pressure differential is determined from a characteristic curve characterizing the second intake valve.

30. (Previously Presented) The device as recited in Claim 29, wherein the characteristic curve is a curve characterizing a correlation between the second pressure differential and the coil current for generating the second pressure differential.

31. (Previously Presented) The device as recited in Claim 24, wherein the linking indicates a maximum value for a difference between the first pressure differential and the second pressure differential.

32. (Previously Presented) The device as recited in Claim 24, wherein the linking indicates a difference between the first pressure differential and the second pressure differential.

33. (Previously Presented) The device as recited in Claim 32, wherein a difference between the first pressure differential and the second pressure differential is a function of at least one of an existing driving condition and the time.

34. (Previously Presented) The device as recited in Claim 24, wherein the two wheels belong to the same axle.

35. (Previously Presented) The device as recited in Claim 24, wherein the first intake valve and the second intake valve are differential pressure regulating valves, wherein a coil current through the first intake valve is determined, and wherein the first pressure differential is determined from the coil current through the first intake valve, wherein the first pressure differential is determined from the coil current through the first intake valve by evaluating a characteristic curve, and wherein a difference between the first pressure differential and the second pressure differential is a function of at least one of an existing driving condition and the time.

36. (Previously Presented) The device as recited in Claim 35, wherein the linking indicates a maximum value for a difference between the first pressure differential and the second pressure differential.

37. (Previously Presented) The device as recited in Claim 35, wherein the linking indicates a difference between the first pressure differential and the second pressure differential.

38. (Previously Presented) The device as recited in Claim 24, wherein the first intake valve and the second intake valve are differential pressure regulating valves, wherein the coil current for generating the second pressure differential is determined from a characteristic curve characterizing the second intake valve, wherein the characteristic curve is a curve characterizing a correlation between the second pressure differential and the coil current for generating the second pressure differential, and wherein a difference between the first pressure differential and the second pressure differential is a function of at least one of an existing driving condition and the time.

39. (Previously Presented) The device as recited in Claim 38, wherein the linking indicates a maximum value for a difference between the first pressure differential and the second pressure differential.

40. (Previously Presented) The device as recited in Claim 38, wherein the linking indicates a difference between the first pressure differential and the second pressure differential.

41. (Previously Presented) The method as recited in Claim 14, wherein the first intake valve and the second intake valve are differential pressure regulating valves, wherein a coil current through the first intake valve is determined, and wherein the first pressure differential is determined from the coil current through the first intake valve, wherein the first pressure differential is determined from the coil current through the first intake valve by evaluating a characteristic curve, and wherein a difference between the first pressure differential and the second pressure differential is a function of at least one of an existing driving condition and the time.

42. (Previously Presented) The method as recited in Claim 41, wherein the linking indicates a maximum value for a difference between the first pressure differential and the second pressure differential.

43. (Previously Presented) The method as recited in Claim 41, wherein the linking indicates a difference between the first pressure differential and the second pressure differential.

44. (Previously Presented) The method as recited in Claim 14, wherein the first intake valve and the second intake valve are differential pressure regulating valves, wherein the coil current for generating the second pressure differential is determined from a characteristic curve characterizing the second intake valve, wherein the characteristic curve is a curve characterizing a correlation between the second pressure differential and the coil current for generating the second pressure differential, and wherein a difference between the first pressure differential and the second pressure differential is a function of at least one of an existing driving condition and the time.

45. (Previously Presented) The method as recited in Claim 44, wherein the linking indicates a maximum value for a difference between the first pressure differential and the second pressure differential.

46. (Previously Presented) The method as recited in Claim 44, wherein the linking indicates a difference between the first pressure differential and the second pressure differential.

REMARKS

Claims 14 and 16 to 46 are now pending in the present application.

It is respectfully submitted that all of the presently pending claims 14 and 16 to 46 are allowable, and reconsideration is respectfully requested.

Applicants thank the Examiner for acknowledging the claim for foreign priority, and for indicating that all certified copies of the priority documents have been received from the International Bureau.

Claims 14 to 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,388,896 ("Hartmann") in view of U.S. Patent No. 6,030,055 ("Schubert").

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Also, as clearly indicated by the Supreme Court in *KSR*, it is "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). In this regard, the Supreme Court further noted that "rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.*, at 1396. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

While the obviousness rejection of claim 14 may not be agreed with, to facilitate matters, claim 14 has been rewritten to better clarify its subject matter.

Claim 14, as presented, includes the feature of *determining a desired second pressure differential of the hydraulic pressure differentials dropping at the second intake valve from*

*a first pressure differential of the hydraulic pressure differentials dropping at the first intake valve; determining, from the desired second pressure differential, a coil current for generating the desired second pressure differential; and using the determined coil current to generate the desired second pressure differential.*

As explained below, the “Hartmann” reference does not disclose nor suggest the features of *determining a desired second pressure differential of the hydraulic pressure differentials dropping at the second intake valve from a first pressure differential of the hydraulic pressure differentials dropping at the first intake valve*. The “Schubert” reference also does not, and is not asserted to, disclose nor suggest these claim features.

Further, even assuming that the “Schubert” reference shows determining current from a differential pressure and vice versa (which is not agreed with), the “Schubert” reference still does not help render obvious the presently claimed features of claim 14. This is because neither the “Hartmann” reference nor the “Schubert” reference disclose or suggest the feature of *determining a desired second pressure*, as provided for in the context of the presently claimed subject matter. The correlation between pressure difference and activation current referred to by the “Schubert” reference does not render obvious the subject matter of claim 14. The “Hartmann” reference would have to first disclose *determining a desired pressure* (which it does not) before the “Schubert” reference could possibly be used to correlate the desired pressure difference to an activation current. Accordingly, the combined teachings of the “Hartmann” and “Schubert” reference do not render obvious claim 14.

The “Hartmann” reference does not disclose nor suggest the feature of *determining a desired second pressure differential of the hydraulic pressure differentials dropping at the second intake valve from a first pressure differential of the hydraulic pressure differentials dropping at the first intake valve*. The Office Action conclusorily asserts that the “Schubert” reference renders obvious the feature of employing a differential pressure (which assertion is not agreed with). Regardless of the accuracy of this assertion, however, the “Hartmann” reference does not disclose nor suggest the feature of *determining a desired second pressure value from a first pressure value*.

Even if the “Hartmann” reference may refer to measuring what the pressure values on two wheels are in that system, the “Hartmann” reference does not disclose nor suggest the feature of *determining a desired pressure value for a second wheel from a measured pressure value for a first wheel*, as provided for in the context of the presently claimed subject matter. Further, even if the “Hartmann” reference may refer to a threshold pressure



differential between two wheels, the “Hartmann” reference does not disclose nor suggest *determining a desired pressure value for one wheel from a pressure value for another wheel*. The “Hartmann” reference (col. 4, lines 40-54) states that:

This block 1 formulates the braking-pressure differentials  $\Delta p_v = p_1 - p_2$  and  $\Delta p_H = p_3 - p_4$  of the wheels of the two axles and feeds corresponding signals together with (plus or minus) signs to the comparators 2 and 3. Maximum permissible braking-pressure differentials, which are formulated in a block 4 with the help of the transversal-acceleration and vehicle-speed variables in accordance with the relations clarified above, are also fed to these comparators 2 and 3. If the absolute value of the differential value  $\Delta p_v$  or  $\Delta p_H$  exceeds the comparison value  $\Delta p_{sv}$  or  $\Delta p_{SH}$ , then, depending upon the sign of  $\Delta p_v$  or  $\Delta p_H$ , one of the valves 5a or 5b or 6a or 6b allocated to the wheels 50 is triggered to prevent a further build up of pressure on the corresponding wheel having the higher pressure.

Specifically, the “Hartmann” reference merely refers to measuring a pressure differential between two wheels and comparing that differential to a maximum permissible differential. If the measured differential exceeds the maximum differential, then a valve is triggered to prevent a further build up of pressure.

Accordingly, for at least the foregoing reasons, claim 14, as presented, is allowable, as are its dependent claims 16 to 23 and 41 to 46.

Claim 24, as presented, includes features like those of claim 14, as presented, and is therefore allowable for essentially the same reasons as claim 14, as are its dependent claims 25 to 40.

In summary, all of claims 14 and 16 to 46 are allowable.

**CONCLUSION**

In view of the foregoing, it is respectfully submitted that all pending claims 14 and 16 to 46 are in condition for allowance. It is therefore respectfully requested that the rejections and objections be withdrawn. Since all issues raised by the Examiner have been addressed, an early and favorable action on the merits is respectfully requested.

Respectfully submitted,

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